resembling the first stage of pneumonia; colour dusky-red; tissue somewhat condensed and imperfectly crepitant; pleura healthy; pericardium healthy, containing no serosity; two large ecchymoses, one on the left and the other on the right side of the heart, at its base, beneath the pericardium; slight ecchymosis posteriorly beneath lower margin of auricles; slight engorgement of coronary vessels; length of heart from apex to origin of pulmonary artery fourteen lines; breadth, midway between the two points, twelve and a half lines; width of pulmonary artery three lines and a half; aorta three and one-fourth; cavity of ventricle of natural size; greatest thickness of walls of same, and also of septum, two lines; cavity of right ventricle of natural size; walls a line in thickness; mitral and tricuspid valves healthy; orifices of the pulmonary artery and aorta perfectly natural; septum ventriculorum perfect; auricles healthy, neither hypertrophied nor dilated; foramen ovale patulous, arising not from imperfect closure, but from original malformation of the valve; instead of two laminæ, an upper and lower placed in juxtaposition, there are two folds, so thin as to appear to be formed almost solely of the lining membrane of the auricle, attached to the inferior and anterior margin of the opening, and diverging from each other; the extremities of their posterior edge or border, or that inserted in the corresponding portion of the auricle, being about three lines apart. The opening formed of the upper or concave margin of these folds, and thick margin or edge common to the two auricles, is about two lines in diameter; mucous membrane of the *stomach* slightly red from imbibition, and containing a considerable quantity of spumous blood; *colon* distended by meconium of a greenish grass colour; mucous membrane, as well as that of small intestine, perfectly healthy; *liver* of ordinary size, right lobe congested, a small quantity of black blood exuding on being incised; spleen of a slaty colour, and not enlarged; *kidneys* healthy.

Philadelphia, April, 1838.

Art. VII. *Amputation at the Hip Joint.* By Daniel Brainard, M. D., of Chicago, Illinois.

In January, 1837, I was called to Michael Donnahue, ætat 25 years, a labourer, having a large tumour of the left femur.

He gave me the following history of his disease:—Nine months previously he had his left femur fractured, about six inches from its lower extremity, by the falling in of a bank of earth under which he was labouring, at Schenectady, in the State of New York. Before this was properly consolidated, he travelled by a canal boat to Buffalo, from thence to Detroit by steamboat, and from thence to Chicago, a distance of about two hundred and fifty miles, on foot. Soon after his arrival here, he noticed a tumour on the outside of the thigh, growing from the place of fracture. It increased rapidly; soon involving the whole circumference of the limb, and nearly the whole length of the femur. At the time when I first saw him, the tumour extended downward to the knee joint, and upward to within three inches of the trochanter major on the outside, and within three fingers' breadth of the tuber ischii behind; measuring at its largest part, thirty-two inches in circumference. Its growth had been attended with but little pain; its surface was hard and irregular, and slightly tender on pressure. Two of the lymphatic glands of the groin were considerably enlarged. The general health of the patient had suffered much; he was pale and greatly emaciated; got no sleep at night, and had no appetite. Careful examination of the thorax and abdomen could, however, detect no signs of disease in either. As every means for arresting the growth of the tumour had been diligently employed without success, amputation seemed the only resort that offered a chance of recovery.

On the 14th January, the operation was performed, in the following manner. The femoral artery being compressed where it passes over the pubis by my friend Dr. Walker, a circular incision was made through the skin and tissues immediately subjacent, about four inches below the trochanter major; the integuments were dissected up, and a retractor applied. The muscles were then divided by a similar incision, and the bone sawed just at the lower part of the trochanter minor. The femoral artery and the profunda femoris were then immediately secured by ligatures. Considerable pieces of cartilage and of diseased cellular tissue were removed from the surface of the stump; and all the small arteries that bled were then secured.

On examining the stump, the bone was found to be diseased; its cavity was filled with a reddish, gelatinous and semi-fluid matter. The periosteum was thickened, and in some parts cartilaginous. I then proceeded, according to my original intention in such a contingency, to remove the bone at its articulation. Dividing the psoas and iliac muscles and the muscles that come from the pelvis to be attached about the roots of the two trochanters, with a scalpel, and the insertions of the glutei and the capsular ligament with a bistoury, I was enabled with the latter instrument to divide the round ligament, and remove the head of the bone, without the least difficulty or delay. The articular cartilage over the head of the bone was thicker than natural, but the acetabulum appeared healthy. The hemorrhage was not great, except from the superficial vessels on the first incision; these for a moment bled profusely. Seven ligatures were required.

The patient was very timid, and suffered much from fear; during the operation he was so far exhausted as to require artificial warmth and diffusible stimuli, and remained thus depressed for a considerable time. On his reviving, the sides of the wound were brought together in a vertical line, and secured by adhesive straps, the ligatures being left out at the angles. A roller was passed around the pelvis in such a manner as to secure a compress over the glutei muscles, and afterward passed a few times about the stump, and the patient put to bed.

Evening. Has nausea and occasional vomiting; pulse 100, weak; no pain, but considerable restlessness; directed him to take sulph. morph. ¼ gr.

15th. The patient has passed a good night; tongue white and dry; stomach still irritable; drinks rejected during the day. A sinapism was applied to the epigastrium, and the morphia administered in the evening.

16th. He has rested well during the night; pulse 95; tongue and skin dry; nausea subsided. Sulph. magnes. ℥i. was directed; it moved the bowels once freely, and the morphia was then given.

17th and *18th.* Pulse 93; skin natural; urine copious. The morphia was administered as usual at evening, the patient being unable to sleep without it.

19th. He has slept but little during the night; pulse 116; discharge from the stump profuse; dressings removed; the wound has adhered for two-thirds of its extent adjoining the superior angle; much serous matter and some fetid air escaped from the lower part on pressure. Morphia given as usual.

20th. Pulse 110; slight pain in the stump and in the bowels; skin dry. Tinct. rhei. ℥i. was administered.

21st. Bowels have been moved freely; pulse 95; no pain; removed a part of the dressings; the serous discharge is copious.

22nd. No material change; diet more nourishing; morphia omitted.

23d. Dressed the stump; the four ligatures left out at the lower angle came away; the discharge much diminished and of good pus.

From this period until February 3d, nothing worthy of particular note occurred; the patient's appetite and digestion were good, and all the functions were well performed. On the 3d, the three ligatures that were left out at the upper angle came away. The man continued to do well, being free from pain and uneasiness of any kind, and able to move himself about without difficulty; the wound healing, and the suppuration daily becoming less.

February 15*th*. A hard tumour is discernible in the left iliac region; he is troubled at night with a dry cough; pulse 110; the wound continues to heal; the discharge from the 16th to the 25th February not amounting to more than f. ℥i. in twenty-four hours. In the mean time, the tumour just mentioned increased rapidly, presenting a hard, knotted and uneven surface.

17*th*. The stump is noticed to be slightly swelled; and on examination numerous hard bodies are discovered at various parts of its surface. The cough is severe, and not allayed by anodynes.

20*th*. An unusual pulsation is observed about the end of the femoral artery, which appears to be aneurismal in character. Cold applications and compression made to the part, and strict rest enjoined.

26*th*. The pulsating tumour, which had gradually increased in size, gave way after a severe fit of coughing. On arriving, I found him weak and exhausted from loss of blood. I proposed to tie the femoral artery, but the patient and his friends refused to permit me. The same means were therefore continued.

From February 26th to March 1st, he failed rapidly; his cough was more severe, his pulse more frequent. The tumour before mentioned extended to the symphysis pubis, and projected above the crest of the ilium; and the projections on the surface of the stump were greatly increased.

March 1*st*. At one o'clock A. M. the bleeding recurred, and, the patient consenting, I placed a ligature around the femoral artery, just below Poupart's ligament. The pulsation immediately ceased. He lost no blood by the operation, and did not appear to be much affected by it. He continued to sink, however, and died on the evening of March 2nd, forty-two hours after the tying of the artery, and forty-eight days after the amputation of the limb.

On sawing through the femur and diseased mass longitudinally, the former was seen to be involved in its entire circumference, and from the condyles to near the trochanter minor; its cavity, too, on either side of the fracture, was filled with cartilaginous and semi-ossified matter. The largest part of the tumour sprung directly from the place of fracture; it consisted of alternate layers of cartilaginous and calcareous matter, disposed in form of radii. Other portions, entirely cartilaginous, sprung from the periosteum above and below. Numerous distinct pieces, from the size of a pea to that of a hickory nut, were found in the ham and above the tumour, which were only loosely joined to the original mass by cellular tissue.

On opening the stump, a narrow passage was seen leading directly to the acetabulum, having its surface callous, like that of an old fistula. The acetabulum itself was sound; the cartilage had not sloughed, and its cavity was nearly filled with granulations springing from its edges. The ends of the divided muscles were tipped with cartilage, and similar pieces were imbedded between the muscles. Just at the end of the femoral artery was a sack large enough to contain f. ℥iv., which had given way at its lower part. Above this the ligature was found about the artery; the inner coats of the vessel were divided by it.

On laying open the abdomen, a large cartilaginous and bony mass was seen filling up the hollow of the left ilium, extending downward into the cavity of the pelvis, and upward to near the kidney. The external iliac artery passed through it.

Both pleuræ were found studded with pieces of bone and cartilage, from the size of a pea to that of an almond; they were mostly of a circular or oval figure, and flattened, so as to resemble a button in form; at the centre of each was a small calcareous granule, by which it was attached to the pleura. These were arranged in rows corresponding to the ribs, but not attached to them. Similar pieces in great numbers were found imbedded in all the lobes of either lung; most numerous, however, in the left.

No other marks of disease were observed in any part of the body.

The enlargement of the inguinal glands, mentioned in the description of the tumour, arose from the irritation of a blister, and subsided soon after the operation.

The reasons that induced me to adopt the method by circular incision in preference to that by flaps, were these:—It was first intended to divide the bone through, or below, the trochanters; and it was necessary to remove the diseased muscles as high as the bone itself, while enough of the integuments must be left to cover the stump; this could most easily be effected by the circular incisions. Such, however, was the ease with which the head of the bone was removed from the acetabulum, the neatness with which the sides of the wound came together, and the readiness of a great part of it to heal by the first intention, that it is not easy to conceive what advantage the more ordinary method can possess, even when the peculiar circumstances of this case do not exist, and when the design from the first is to remove the bone at its articulation.

To Drs. Goodhue and Walker, of this city, I am particularly indebted for their skilful assistance during the operation, as well as for their judicious advice both before and subsequently.

Chicago, March 10, 1838.